of pads and folds it also differs from all studied members of Sylviinae and Turdinae.)

(h) feathering finer and closer than *Trichastoma*.

(i) Vocalisations.

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Vocal mimicry in the lark *Mirafra hypermetra* as a possible species-isolating mechanism

by Françoise Dowsett-Lemaire & R. J. Dowsett

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The lark *Mirafra hypermetra* is usually considered to be a good species by ornithologists in East Africa (e.g. Williams 1963: 180), but no justification for this appears to have been published. Hall & Moreau (1970: Map 7) treat *m. hypermetra* and *M. africana* as separate species, though without great conviction. In a review of *M. africana* (*sensu latu*) White (1960: 8–9) has

described the considerable differences in size, structure and colour pattern between *africana* and *hypermetra*. He considers that the race *gallarum* links the two and provides evidence for their being conspecific, which is how he treats them in his *Check List* (White 1961: 13). However, he does admit the need for more research in the field to confirm these conclusions.

During a visit to Kenya in December 1976 we found considerable differences in the vocalisations of *africana* and *hypermetra*, the latter being a very accomplished mimic.

Vocalisations

In Kenya F. D.- L. was able to make tape recordings of the songs of *africana* and *hypermetra*, using an Uher 4000 recorder. The tapes have subsequently been analysed on a Kay sonograph.

Mirafra africana. The song in Kenya consists of a succession of short whistled phrases, regularly spaced, such as those of a bird at Naro Moru near Mount Kenya (0° 10′ S, 37° 01′ E.) (Fig. 1A). Each phrase lasts about

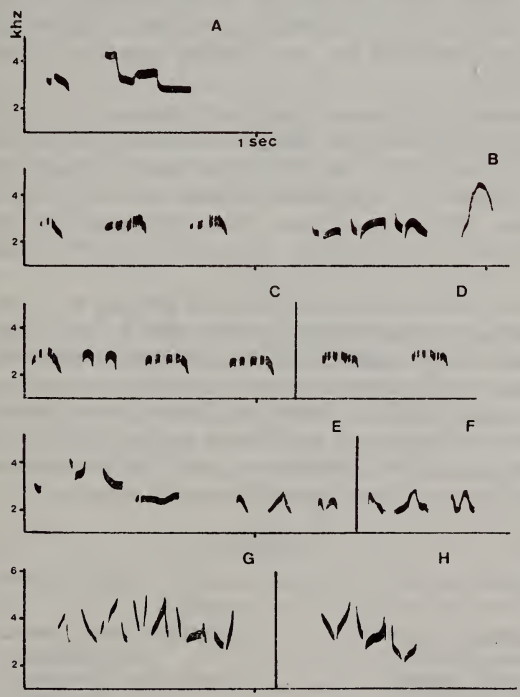

Fig. 1. The songs of *Mirafra africana* and *M. hypermetra*, recorded in Kenya. Sonograms of: (A) song (simple whistle) of *africana*; (B) a song phrase of *M. hypermetra*, preceded by imitation of three notes of *Merops superciliosus*; (C) authentic call of *Merops s. superciliosus* (Livingstone, Zambia); (D) authentic call of *M. s. persicus* (Blue Lagoon, Zambia); (E) a song phrase of *M. hypermetra*, ending with imitation of the song of *Caprimulgus donaldsoni*; (F) authentic song of *C. donaldsoni* (Kenya: Myles North); (G) authentic song of *Cisticola cinereola* (Tsavo, Kenya); (H) imitation (shortened version) of song of *C. cinereola* by *M. hypermetra*.

0·6 seconds, and is separated from the next by an interval of 2 seconds. The same phrase, very monotonous to the human ear, may be repeated 20 times or more, before the singer changes to another motif. In our experience the Kenya song is very similar to that uttered by *africana* in Zambia. (Benson (1948: 56) has reported an apparent similarity between the voices of Kenyan and Rhodesian birds.)

We did not notice any 'flappeting' by *africana* in Kenya, although we frequently observed such behaviour by territorial males of the montane race *M. africana nyikae* on the Nyika Plateau (Malawi/Zambia) in December 1977 and D. R. Aspinwall has occasionally noticed 'flappeting' by individuals of lowland races in southern Zambia. 'Flappeting' by *africana* involves a male jumping a few cm into the air from his song post and vibrating his wings, producing a short burst of sound much like that made by the lark *Mirafra rufocinnamomea.*

The song of *africana* is usually devoid of imitations, and we noticed none in Kenya. However, it has been found to mimic on rare occasions elsewhere (Took 1961, Vernon 1973), though its efforts are clearly not elaborate. The occurrence of imitation in the songs of at least 5 African species of lark (Vernon 1973) suggests that the use of mimicry may not necessarily indicate close relationship.

Mirafra hypermetra. We found this form common on 2 December on the plains of Tsavo West National Park, in the area between Mzima Springs and Kilaguni (2° 50′ S, 38° 00′ E). Males were singing from the tops of isolated thorn bushes, in a habitat in which the other dominant lark was *Mirafra albicauda.* Their voices were extremely powerful, carrying several hundred metres, and three birds we observed closely were clearly answering each other.

In contrast to the monotonous whistles of *africana*, the song of *hypermetra* is strikingly attractive and varied. In part this is due to its considerable ability to imitate other species, but its own basic repertoire is also more elaborate. Mimicry by *hypermetra* appears to receive no mention in the literature, except in passing by Lack (1977: 38). During 15 minutes tape recording we could identify imitations of 20 different species (Table 1). Most of these were later sonographed for confirmation, and each is a common bird in this part of Tsavo, 4 or 5 of them being Palaearctic migrants.

TABLE 1

Species recorded in the imitative song of *Mirafra hypermetra*

Non-Passerines:
Phasianidae: *Francolinus sephaena*
Otididae: *Eupodotis ruficrista*
Charadriidae: *Vanellus coronatus*
Scolopacidae: *Tringa glareola*
Caprimulgidae: *Caprimulgus donaldsoni*
Coliidae: *Colius macrourus*
Meropidae: *Merops superciliosus*
Bucerotidae: *Tockus nasutus*

Passerines:
Alaudidae: *Mirafra albicauda*
M. poecilosterna
Hirundinidae: *Hirundo rustica*
H. abyssinica
Delichon urbica
Sylviidae: *Cisticola cinereola*
Malaconotidae: *Tchagra senegala*
Motacillidae: *Motacilla flava*
Sturnidae: *Spreo superbus*
Buphagus erythrorhynchus
Ploceidae: *Plocepasser mahali*
Estrildidae: *Ortygospiza atricollis*

The imitations are usually very short, often less than one second, and are interspersed with notes of the proper song. Fig. 1B illustrates 3 calls of the bee-eater *Merops superciliosus* imitated by *hypermetra*, followed by its own song phrase. To demonstrate the fidelity of this imitation, sonograms C and D in Fig. 1 show respectively the calls of the Malagasy/Ethiopian nominate *Merops* and of the Palaearctic *M. s. persicus*, from recordings made in Zambia. The calls of these 2 bee-eaters appear, in fact, to be nearly identical, and lend no support to the suggestion that the 2 races should be considered separate species. Similarly, sonograms E and F show the exact copy and the genuine song of the nightjar *Caprimulgus donaldsoni*, and G and H the genuine and the exact copy of the song of the warbler *Cisticola cinereola*.

One phrase of 12 seconds from a singing *hypermetra* contained short imitations of 5 different species, mingled with the lark's own whistles. Phrases are on average noticeably longer than those of *africana*: 71 phrases from one singer lasted 1–15 secs (mean 3·8), with intervals of 1–11 secs (mean 3·0), and 70 phrases from another bird lasted 1–5 secs (mean 2·3), with intervals of 1–3·5 secs (mean 2·1). This variability in length of phrases and intervals also contributes to the overall impression of variety in the song of *hypermetra*. Moreover, phrases were not repeated in succession more than 3 or 4 times; the singer would either alter the previous motif with some variation, or switch to a completely different song phrase. Often phrases would be copied by neighbouring singers, and clearly imitation formed an important component of the song in this population. It remains to be discovered if this is the case throughout the range of *hypermetra*.

Ecological allopatry

We have not reinvestigated the question of subspecific limits within *Mirafra africana* (*sensu latu*), which have been discussed in detail by White (1956, 1959, 1960, 1961); but with the exception of the possibly anomalous *gallarum* (skins of which seem to us to be closest to *hypermetra*) and *kathangorensis*, there seems little evidence to warrant uniting *hypermetra* and *africana* specifically. Even in a family in which morphological characters are greatly influenced by environment, the differences in size and structure, and the distinctive chest markings of *hypermetra* (clearly visible in territorial males), should normally be enough to warrant their specific separation. Songs may be even more important as species-isolating mechanisms, and our observations suggest that those of *hypermetra* and *africana* are so dissimilar as to preclude interbreeding.

At Naro Moru near Mount Kenya we thought we saw and heard *hypermetra* on 4 December: the bird was large, with strikingly clear chest patches and a varied, imitative song. Although this is at a considerably higher altitude than *hypermetra* has been reported before (c 2000 m), it was in dry scrub vegetation. Unfortunately we could not find this bird again to tape record it next day, but only 800 m distant we found a typical male *africana* in song, to which we played a brief tape of *hypermetra* song, but with no significant response. The possibility of sympatry in this area needs to be investigated further.

Normally *hypermetra* is found at a lower altitude than *africana*, on semi-a plains with scattered thorn bushes, from the tops of which it sings.

contrast, *africana* occurs on the cooler high-altitude grasslands, where it sings from a variety of perches and even on the ground.

White (1960: 9) has remarked on a specimen of *hypermetra* from Loliondo in Tanzania (2° 03′ S, 35° 40′ E), apparently from the same general area as *africana*, but at a lower altitude. If altitudinal segregation is found to be the rule in areas where sympatry is approached, and evidence of regular hybridisation is lacking, this would seem to argue for specific distinctness. White has pointed out that it is unusual for a low-altitude subspecies to be so much larger than adjacent highland relations; this is contrary to Bergmann's Rule, and is a further indication that we may be dealing with 2 genetically distinct forms.

Hybridisation between morphologically similar species, which normally have distinctive vocalisations, can occur if an individual male produces a mixed song (Lemaire 1977). However, occasional hybridisation under such conditions need not mean that such forms are conspecific.

Clearly more field observation is required, particularly where there is possible sympatry between *hypermetra* and *africana*, of vocalisations, the incidence of mimicry and other isolating mechanisms, especially of forms of supposed doubtful affinity, such as *gallarum*. Meanwhile, we feel that *M. africana* and *M. hypermetra* are most conveniently considered separate species.

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Records of migrants from Grand Cayman Island

by Jon C. Barlow

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Between 23 April and 1 May 1974 Michael McNall and I studied vireos on Grand Cayman, the largest and western-most of the three Cayman Islands. In the course of our field work several noteworthy records were obtained which serve further to clarify the status of certain migratory or far ranging